| Notice of Allowability | Application No. | Applicant(s) | |
|---|---|---|---|
| | 10/656,253 | HAWTHORNE ET AL. | |
| | Examiner | Art Unit | |
| | Cuong V. Luu | 2128 | |

*-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--*

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to *4/17/2007*.

2. ☒ The allowed claim(s) is/are *1-15*.

3. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
   a) ☐ All b) ☐ Some* c) ☐ None of the:
      1. ☐ Certified copies of the priority documents have been received.
      2. ☐ Certified copies of the priority documents have been received in Application No. _____ .
      3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

   * Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.
**THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.**

4. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.

5. ☐ CORRECTED DRAWINGS ( as "replacement sheets") must be submitted.
   (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review ( PTO-948) attached
      1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
   (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.

   **Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).**

6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

**Attachment(s)**

1. ☒ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)
3. ☐ Information Disclosure Statements (PTO/SB/08), Paper No./Mail Date _____
4. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material
5. ☐ Notice of Informal Patent Application
6. ☐ Interview Summary (PTO-413), Paper No./Mail Date _____ .
7. ☒ Examiner's Amendment/Comment
8. ☒ Examiner's Statement of Reasons for Allowance
9. ☐ Other _____.

FRED FERRIS
PRIMARY EXAMINER
TECHNOLOGY CENTER 2100

## DETAILED ACTION

Claims 1-15 are pending. Claims 1-15 have been examined. Claims 1-15 have been allowed.

## EXAMINER'S AMENDMENT

Paragraph [0001] of the specification has been amended as follows:

This is a Divisional of U.S. Patent Application No. 09/404,826, now U.S. Patent 7,188,341, filed on September 24, 1999.

### *Allowable Subject Matter*

**Claims 1-15 are allowed. The following is an examiner's statement of reasons for allowance:**

1. As per claim 1, the prior art, Mosier (U.S. Patent 4,041,283), teaches a method of simulating a model having initial parameters of a simulator comprising:

   inputting data from a train into the simulator;

   operating the simulator with the data and the initial parameters to produce model data;

   but does not teach following limitation in combination with the above limitations:

   adjusting automatically by software the initial parameters of the dynamic model until the model data matches the data from the train

   as recited by the claimed invention.

2. As per claim 5, the prior art, Mosier (U.S. Patent 4,041,283), teaches a method of simulating a model having initial parameters of a simulator comprising:

inputting data from a train into the simulator;

operating the simulator with the data and the initial parameters to produce model data;

but does not teach the following limitations in combination with the above limitations:

identifying parameters to adjust by comparing the model data and the train data during a change of velocity; and

adjusting automatically by software the initial parameters of the dynamic model until the model data matches the data from the train

as recited by the claimed invention.

3. As per claim 6, the prior art, Mosier (U.S. Patent 4,041,283), teaches a method of simulating a model having initial parameters of a simulator comprising:

inputting data from a train into the simulator;

operating the simulator with the data and the initial parameters to produce model data;

but does not teach the following limitations in combination with the above limitations:

identifying parameters to adjust by comparing the model data and the train data during a change one or more trip features including: curves, grades, braking and throttle changes; and

adjusting automatically by software the initial parameters of the dynamic model until the model data matches the data from the train

as recited by the claimed invention.

4. As per claim 10, the prior art, Mosier (U.S. Patent 4,041,283), teaches having a processor including a dynamic train model and initial parameters, the method simulating includes:

inputting real time measured train data from the train into the processor;

running the train dynamic model with the initial parameters to produce modeled train data;

compare the modeled train data and the measured train data; and

but does not teach the following limitation in combination with the above limitations:

adjusting automatically by software the initial parameters of the model until modeled train data matches the measured train data

as recited by the claimed invention.

## *Conclusion*

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Cuong V. Luu whose telephone number is 571-272-8572. The examiner can normally be reached on Monday-Friday 8:30am-5:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kamini Shah, can be reached on 571-272-2279. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300. An inquiry of a general nature or relating to the status of this application should be directed to the TC2100 Group receptionist: 571-272-2100.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

**CVL**

FRED FERRIS
PRIMARY EXAMINER
TECHNOLOGY CENTER 2100

## CLAIMS SUMMARY

1. (Currently Amended) A method of adjusting a dynamic model having initial parameters of a simulator ~~having initial parameters~~ comprising:

inputting data from a train into the simulator;

operating the simulator with the data and the initial parameters to produce model data; and

adjusting automatically by software the initial parameters of the dynamic model ~~simulator~~ until ~~data of~~ the model data ~~simulator~~ matches the data from the train.

2. (Original) A method according to Claim 1, wherein the parameters include one or more of grade resistance, curve resistance, rolling resistance, tractive effort of the train's locomotives, dynamic brake effort of the locomotives, pneumatic brake system, and train weight.

3. (Original) A method according to Claim 1, including analyzing the inputted data on the simulator after adjusting of the parameters.

4. (Original) A method according to Claim 3, wherein the analysis includes identifying anomalies in the inputted data and reporting the anomalies.

5. (Currently Amended) A method ~~according to Claim 1, wherein adjusting the parameters includes~~of adjusting a dynamic model having initial parameters of a simulator comprising:

inputting data from a train into the simulator;

operating the simulator with the data and the initial parameters to produce model data;

identifying parameters to adjust by comparing the ~~simulator~~ model data and the train data during a change of velocity; and

adjusting automatically by software the identified initial parameters of the dynamic model until model data matches the data from the train.

6. (Previously Presented) A method ~~according to Claim 1, wherein the train data is from an event recorder on the train and adjusting the parameters includes~~ of adjusting a dynamic model having initial parameters of a simulator comprising:

inputting data from a train into the simulator;

operating the simulator with the data and the initial parameters to produce model data;

identifying parameters to adjust by comparing the ~~simulator~~ model data and the ~~event recorder~~train data during one or more trip features including: curves, grades, braking and throttle changes; and

adjusting automatically by software the identified initial parameters of the dynamic model until model data matches the train data.

7. (Original) A method according to Claim 1, wherein the train includes plural event recorders storing the train data and including inputting data from each of the event recorders into the simulator and operating the simulator and adjusting the parameters using the data from all the event recorders.

8. (Original) A method according to Claim 1, including providing a simulator on the train.

9. (Original) A method according to Claim 8, including storing the adjusted parameters with the data of the train on an event recorder on the train.

10. (Previously Presented) In a train having a processor including a train dynamic model and initial train parameters, the method for fine tuning the model includes:

inputting real time measured train data from the train into the processor;

running the train dynamic model with the initial parameters to produce modeled train data;

compare the modeled train data and the measured train data; and

adjusting automatically by software the initial parameters of the model until modeled train data matches the measured train data.

11. (Previously Presented) A method according to Claim 10, wherein the parameters include one or more of grade resistance, curve resistance, rolling resistance, tractive effort of the train's locomotives, dynamic brake effort of the locomotives, pneumatic brake system, and train weight.

12. (Previously Presented) A method according to Claim 10, wherein adjusting the parameters includes identifying parameters to adjust by comparing the modeled data and the measured data during a change of velocity.

13. (Previously Presented) A method according to Claim 10, wherein the measured train data is from an event recorder on the train.

14. (Previously Presented) A method according to Claim 13, wherein the adjusting of the parameters includes comparing the modeled data and the event recorder data during one or more trip features including: curves, grades, braking and throttle changes.

15. (Previously Presented) A method according to Claim 13, including storing the adjusted parameters with the data of the train on the event recorder.

Attorney Docket No. 509/35644D
PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

| | | | |
|---|---|---|---|
| Applicant(s): | Michael J. Hawthorne *et al.* | Confirmation No. 8600 | |
| Serial No.: | 10/656,253 | Art Unit: | 2128 |
| Filed: | September 8, 2003 | Examiner: | LUU, Cucong V. |
| For: | **METHOD OF TRANSFERRING FILES AND ANALYSIS OF TRAIN OPERATIONAL DATA** | | |

**AMENDMENT**

Mail Stop Amendments
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

In response to the official Patent Office action dated January 12, 2007 and the interview of April 12, 2007, Applicants request reconsideration of the rejections. Claims 1, 2, 5-7 and 10-14 were rejected as anticipated under 35 U.S.C. 103 by Mosier U.S. Patent 4,041,283 in view of Polivka U.S. 5,828,979. Claims 3, 8, 9 and 15 were further rejected under 35 U.S.C. 103 as being obvious over Mosier and Polivka in combination with Lynch *et al.*, and/or Herzberg *et al.*

Independent Claim 1 is directed to a method of adjusting a dynamic model having initial parameters of a simulator comprising inputting data from the train into the simulator and operating the simulator with the data and initial parameters to produce model data. The next step is adjusting automatically using software the parameters of the dynamic model until the model data matches the data from the train.

Independent Claim 10 is a method for fine-tuning of a train dynamic model in a processor on the train. The method includes inputting real time, measured train data from the train into the processor and running the train dynamic model with the initial parameters to produce modeled train data. Next the model train data and the measured train data are compared and the train parameters for the model are automatically adjusted using software until the modeled train data matches the measured train data.

Applicants agree with the rejection that Mosier does show inputting data from the train into the simulator and operating the simulator with the data. What it does not show is automatically adjusting the parameters of the dynamic model until the model data matches the data from the train. Column 17, lines 30-59 of Mosier does not meet this claim limitation.

It is noted in column 17 lines 50 through 53 "Rolling resistance force $F_{Rn}$ are then corrected to account for breaking forces $F_{Bn}$ to provide a corrected coupler force $F_{RBn}$ at each car." When one reads the patent as a whole, this correction is not a correction of the math model. This is an implementation of the math model. The description of the math model begins at the bottom of column 11 and continues at the top of column 14. As is noted by equation 1, the force $F_{RBA}$ is the sum of the rolling resistance resistance $R_R$, the breaking resistance force $R_B$, and the acceleration resistance $R_A$. The rolling resistance $R_R$ is calculated by formula 2. The breaking resistance $R_B$ is calculated by equation 3 and the acceleration resistance is calculated by formula 4. Each of these formulas for the resistances includes perimeters which are selectable. It's these perimeters which are adjusted in the present invention.

As indicated in the interview, the presence or absence of breaking, which is from the train data, determines whether the breaking resistance $R_B$ is present or not present in the equations 1 and 4. This is not an adjustment of the model, but basically using the train data in the model. Thus the implementation of the model described in column 17 is not an adjustment of the model but it is an implementation of the model. The acceleration resistance factor $R_A$ described in column 17 after the correction of the rolling resistance by the breaking force requires the precalculation of the rolling resistance and the breaking resistance. As noted in equation 4, again this is not an adjustment of the model, but basically implementing the train data using the fixed model.

A diagram of the resistances and force of the math models is illustrated in Figure 8.

As discussed above, Claim 10 is also directed to fine-tuning of a train dynamic model and is on a processor in the drain. With respect to Claim 1, Mosier does not discuss fine-tuning of a model by running the dynamic model and comparing the results of the model train data with the measured train data. Thus, Mosier cannot anticipate nor would it be obvious to modify to meet the limitation of Claim 10.

The original dependent Claims 5 and 6 have been rewritten in dependent form and are allowable for their additional limitation as well as the limitations of Claim 1.

With respect to Claim 5, the area noted in column 18 lines 43 through 52 merely has to do with updating the displays 13 through 18 "When the train has moved far enough to justify redrawing of the profile". The same section is noted in Claim 6 and is also unsupported.

It should be noted the dependent claims are allowable for their own independent limitations, as well as the limitations of independent Claims 1 and 10. All of the claims are considered allowable over the art of record and thus the passage of this case to issue is respectfully solicited.

It is respectfully requested that, if necessary to affect a timely response, this paper be considered as a Petition for an Extension of Time sufficient to affect a timely response and shortages in other fees be charged, or any overpayment in fees be credited, to the Barnes & Thornburg LLP Deposit Account No. 02-1010 (509/35644D).

Respectfully submitted,

BARNES & THORNBURG LLP

Perry Palan
Reg. No. 26,213